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The traditional use of mangroves in East Sumba, Indonesia

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ABSTRACT

The traditional names and uses of 20 mangrove plants and 12 mangrove associates from East Sumba, Indonesia, are presented. Traditional knowledge and contemporary use associated with the mangrove community in general are discussed. For the Sumbanese community, mangrove habitats are important for a number of reasons. Clearing of mangroves causes concern, as does the loss of traditional knowledge of mangroves and their uses. Mangrove destruction also affects local weather conditions and creates airborne dust and sand problems. Mangrove habitats form part of the living area for many people in Melolo.

KEYWORDS: Mangroves, traditional use, ethnobiology, East Sumba, Indonesia.

INTRODUCTION

The island of Sumba lies between the Indian Ocean and Sawu Sea in the Nusa Tenggara Timur Province in eastern Indonesia (Fig. 1). It is one of the major islands in the Lesser Sunda Islands group, along with Bali, Lombok, Sumbawa, Flores and Timor. Sumba is on the outer arc of the Lesser Sunda chain and is of non-volcanic origin. It is relatively dry and barren compared to many other parts of eastern Indonesia.

Sumba is about 300 km long and 80 km wide, with an area of approximately 11,150 km^2, and a population of about 400,000 people. It is divided into an eastern and western regency, which also reflects differences in climate, vegetation, language and culture. West Sumba receives significantly more rain than East Sumba and is

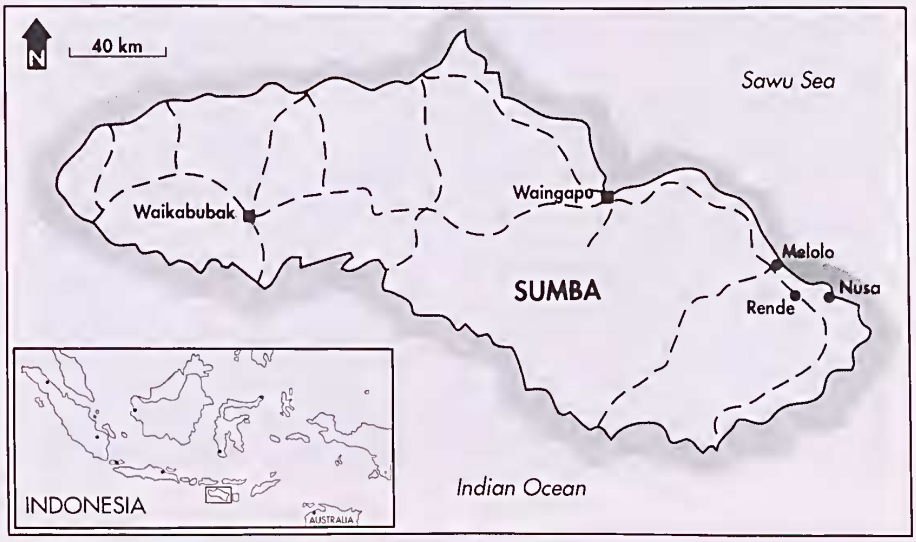

Fig. 1. Locality map for field sites on Sumba, Indonesia.

Fig. 2. Evidence of mangrove destruction at Nusa, East Sumba, Indonesia.

less rocky and mountainous; consequently it is more densely populated, culturally diverse and the vegetation is generally more dense and lush.

East Sumba is characterised by rolling treeless hills in the interior, extensive grassy lowlands and an extended dry season. Annual rainfall is between 600 and 800 mm, which mainly occurs in November to March; for the rest of the year there is little or no rain. Average daily maximum temperatures are high, above 30°C, for the majority of the year.

The population of the East Sumba regency is about 140,000 people; the capital is Waingapu. The people of East Sumba are renowned for their cultural strength and knowledge of natural surroundings. Most still follow their traditional belief system called *marapu*, and speak the traditional language *kambera*.

The mangrove habitat is referred to as *hutan bakau* in Bahasa Indonesian, in East Sumba it is called *bako*. While the traditional language of East Sumba is *kambera*, there are language influences from other parts of the Lesser Sunda group of islands. Some names recorded for mangrove plants were given as coming from Sabu (Savu) or Timor.

There is little published information relating to mangroves in East Sumba. Monk *et al.* (1997) cite some references for Nusa Tenggara Timur Province, though none relate specifically to Sumba; they list 14 species from the province. It is likely that there are more species of mangroves in East Sumba than we have recorded here.

Traditional knowledge and uses relating to mangrove communities in general. The senior Sumbanese people of Melolo consider the mangrove habitat a valuable source of natural resources and an important habitat. They are concerned that the traditional names and uses of plants in the mangroves are not being learnt by younger generations.

They are also concerned by increased use and clearing of mangroves by the current larger populations in some village areas such as Melolo, Nusa and Waingapu. Pressure from people looking for firewood, timber for construction and medicines is particularly obvious in places (Fig. 2).

The river lined with mangroves that passes through Melolo and originates near Rende is locally referred to as *kali obat*, literally medicine river. It is a reference to the healing qualities of the water in the river, which are derived from the wood, bark, leaves, stems, flowers and fruit of mangrove plants that occur in the river. People of Melolo believe that this detritus washing around in the water gives it powerful medicinal qualities to cure skin rashes and disorders. Anyone suffering skin disorders takes a bath in the river to treat the disorder.

Mangrove forests are an important source of firewood for the people of East Sumba who live near the coast. The timbers generally have a high calorific value and are consequently good firewood for cooking. In some areas of mangroves near villages there is evidence of significant felling of large trees to obtain the wood for cooking and for other purposes.

Mangrove communities are used for fishing, especially on the rising tide. Mangrove worms, *Teredo* spp., can be used to bait fishhooks. Mud crabs, *Scylla serrata*, and some shellfish are collected from mangrove areas to be eaten.

This destruction of the fringing mangrove forest and their protective effects has resulted in stronger, dry season, south-easterly winds reaching some village areas. This brings increased airborne dust and sand and increased discomfort, and has even led to some houses being unroofed and suffering other wind damage.

In Melolo, the mangrove community forms the north-east margin of the township. In fact, for many households the edge of the mangrove community forms part of their living area between the parts of the house. Some parts of the living area may be elevated on stilts above high tide in amongst the mangrove plants. Many of the daily chores that take place around the house, kitchen, bathroom and shed occur in these upper tidal zones. As a consequence the mangrove habitat and the mangrove plants form an important part of the daily lives of Sumba people living in these areas.

METHODS

Information relating to the names and uses of mangrove plants at Nusa and Melolo was collected in March 1999, during fieldwork with the senior elders considered most knowledgeable about mangrove habitats (Figs 3-4). Plants were collected and East Sumbanese elders informally interviewed about the species. Plants were also identified in the field by elders who led researchers to plants they considered important and useful.

Information about the uses of mangroves was also obtained by means of direct observation of people in mangrove habitats and people using mangrove species, primarily in the area of Nusa and around the town of Melolo.

Information that relates to plant species that are associated with mangrove communities, but not restricted to mangrove habitats is presented here together with plants traditionally regarded as 'true mangroves'. Data we collected relate to specimens that were found in mangrove communities, and considered part of that habitat by our Sumbanese mentors.

Our East Sumbanese guides and mentors were Bapak Kalejuru at Nusa and Bapak Kanaweo, Bapak Hawupahe, and Bapak Adamingus at Melolo.

Audio data were recorded using a Sony minidisc digital recorder. Written notes were made at the same time to corroborate and clarify the audio recordings. Photographic records of the plants and the data collection were also made.

Plants were identified with their scientific name as they were encountered in the field, and specimens were collected for interview purposes and for later vouchering. The identification of plant vouchers was checked to ensure correct scientific names at Herbarium Bogoriense (BO). Voucher specimen details are given on the second line of each species account and the initials IP refer to Inggit Puji Astuti, and GW to Glenn Wightman. Specimens are lodged at Herbarium Bogoriense, the Indonesian national herbarium in Bogor.

Fig. 3. Inggit Puji Astuti and Kalejuru recording traditional knowledge in mangroves at Nusa, East Sumba, Indonesia.

Fig. 4. Recording traditional knowledge of mangroves used in construction at Nusa, East Sumba, Indonesia.

RESULTS

The traditional names and uses of mangrove plants and associated plants from East Sumba are presented alphabetically by scientific name. Scientific names are based on those in use at Herbarium Bogoriense (BO) and the Northern Territory Herbarium (DNA). The local names are given in bold italics. Family names are based on those used by Mabberley (1990).

Mangrove plants

Aegialitis annulata R.Br. ***Boa***
PLUMBAGINACEAE IP 240 & GW

The wood of the stems is very light and buoyant. Short pieces of timber are used to make life vests for fisherman. The timber is also used to make a float designed to keep a fishhook near the surface of the water when fishing.

Aegiceras corniculatum (L.) Blanco ***Ajubiko, Biko***
MYRSINACEAE IP 241 & GW

The wood is used for making fences. The leaves are fed to goats as forage.

This plant is considered in some areas to be the same as *Lumnitzera racemosa*.

Avicennia marina (Forssk.) Vierh. ***Rowmangani***
VERBENACEAE IP 242 & GW

The twigs and leaves are dried and crushed to a powder, then mixed with the powdered twigs and leaves of *Ceriops tagal*, *biko*, and *Pemphis acidula*, *baku*. This mixture is wrapped in cloth and applied externally to a broken bone; it has the effect of speeding the healing of the bone. The area where the bone is broken must be thoroughly massaged before the poultice is applied.

The wood is used to make handles for *parang* (machete). The wood is also used for building houses and for fences.

Bruguiera exaristata Ding Hou ***Ajuboa***
RHIZOPHORACEAE IP 243 & GW

The wood is used for construction purposes, mainly for building houses.

Bruguiera parviflora Wight & Arn. ***Laru***
RHIZOPHORACEAE IP 244 & GW

The wood is used for construction purposes, mainly for building houses. It is considered to be the male form of *Rhizophora* spp., which is considered to be female.

Ceriops decandra (Griff.) Ding Hou ***Bago***
RHIZOPHORACEAE IP 247 & GW

The hypocotyl that has fallen from the parent tree and is just beginning to establish roots may be used as a float for a fishing line. The lower half of the fleshy, buoyant hypocotyl is tied to the fishing line, near the hook, where it floats and keeps the hook near the surface of the water.

Ceriops tagal (Perr.) C.B.Robinson ***Biko***
RHIZOPHORACEAE IP 248 & GW

The wood from larger trunks may be used for building purposes or for firewood. The stems of small, straight saplings are used to make racks for drying small fish.

The red inner bark is chipped off into small pieces, and boiled in water for 5 minutes. The liquid and bark chips may then be thrown into an area of water to stun fish. The fish can then be easily collected and prepared for eating. This 'fish poison' may be used in salt or freshwater areas.

The red inner bark is also used to obtain a red dye. This is used for any purpose requiring a red colour, but is most famously used to produce the red colour for *ikat* cloth, though the roots of *Morinda citrifolia* are used in preference. The area of East Sumba is recognised throughout Indonesia as being a producer of the highest quality *ikat* cloth.

The twigs and leaves are used medicinally (refer to *Avicennia marina* above, for details of use).

Derris trifoliata Lour. **name uncertain**
LEGUMINOSAE IP 253 & GW

No uses were recorded for this species; although it is widely used as a fish poison in areas to the west and south-east of Sumba.

Kelebodoka
Dolichandrone spathacea (L.f.) Schumann
BIGNONIACEAE IP 254 & GW

This plant has special mystical powers for the people of East Sumba. The old fruit are used in a ceremony to stop rain. The fruit are produced during the wet season from December to March, and the old weathered fruit are available during March and April at the end of the rainy season.

Excoecaria agallocha L. ***Kabutou***
EUPHORBIACEAE IP 255 & GW

The white sap is considered to be very dangerous and must be avoided. If the sap enters the eye it causes blindness and if it touches the skin it causes itching and a rash. It has a very bitter unpleasant taste.

Hibiscus tiliaceus L. ***Daun warung***
MALVACEAE IP 258 & GW

The bark can be stripped off in long lengths that are quite strong. It is sun dried and then plaited into a rope that is used to tie up animals and for other purposes where string is required.

The young leaves are pounded up, and rubbed onto the abdomen of pregnant ladies to make childbirth easy.

The young leaves are crushed together with coconut that has been sun dried and then burnt. This mixture is then rubbed into the scalp of the freshly shaved head of children to promote the growth of thick, black hair.

Biko (Sumba), ***Ajubiko*** (Sabu)
Lumnitzera racemosa Willd.
COMBRETACEAE IP 259 & GW

The red inner bark is chipped off into small pieces and boiled in water for 5 minutes. The liquid and bark chips may then be thrown into an area of water to stun fish. The fish can then be easily collected and prepared for eating. This 'fish poison' may be used in salt or freshwater areas.

The timber is considered to be good firewood.

The leaves are pounded with onion, and this mixture is applied as a compress to treat tired muscles. It is especially effective to treat back pain or an aching lower back resulting from hard physical work.

Pemphis acidula J. R. Forst et G. Forst. ***Baku***
LYTHRACEAE IP 261 & GW

The very hard and strong timber is used to make wooden nails to hammer through planks of timber to attach them to the frame of the hull of a *perahu* (small traditional sailing boat).

The twigs and leaves are used medicinally, refer to *Avicennia marina* for details of use.

Rhizophora apiculata Blume ***Biko***
RHIZOPHORACEAE IP 264 & GW

The wood is used for constructing houses. The bark may be used as red dye for *ikat* cloth, especially at Sabu. The bark is chipped off and pounded, then water is added. The fibre is then soaked in this liquid to make it turn red.

Rhizophora spp. are considered to be the female form of *Bruguiera parviflora*, which is considered to be male.

Rhizophora lamarkii Montrouz. ***Biko***
RHIZOPHORACEAE IP 265 & GW

No uses are recorded for this species in East Sumba.

Rhizophora stylosa Griff. ***Biko***
RHIZOPHORACEAE IP 266 & GW

The long narrow acrial roots are used in the construction of the roof of traditional houses. Large quantities of *Imperata cylindrica*, *alang-alang*, are tied along the length of the root to form thick grassy shingles. These are laid overlapping each other to form the traditional thatched roof of houses in East Sumba.

Sonneratia alba Sm. in B. Rees ***Boa, Pamuhu***
SONNERATIACEAE IP 267 & GW

Branches are broken off and taken to feed the leaves to goats as forage. The wood is used for construction purposes.

Thespesia populnea (L.) Soland. ex Correa — ***Mbudi***
MALVACEAE — IP 268 & GW

The timber is used to make paddles for *perahu* or canoes.

Thespesia populneoides (Roxb.) Kostel. — ***Wahudahi***
MALVACEAE — IP 269 & GW

The leaves are pounded and water added; this is rubbed onto the abdomen of a pregnant woman to make childbirth easier.

The inner bark may be stripped off and sun dried, then made into rope.

Jeruminanga
Xylocarpus moluccensis (Lam.) M. Roem.
MELIACEAE — IP 272 & GW

The timber from large straight trees is used to make planks to construct the hulls of *perahu*. The timber has a very attractive grain and is considered the best available in East Sumba for making *perahu*.

The leaves are added to bath water when having a wash as it makes the person having the bath feel very fresh.

Mangrove associates

Calotropis gigantea (L.) R.Br. — ***Kolerara***
ASCLEPIADACEAE — IP 245 & GW

The stems are cut and dried in the sun, and the fibre of the inner bark is plaited to make a fine rope for fishing lines or fish nets.

name uncertain
Casuarina equisetifolia Forster & Forster f.
CASUARINACEAE — IP 246 & GW

The wood is used for building houses and for firewood. In recent times small plants have also been used as Christmas trees by Sumbanese followers of the Christian faith.

Cordia subcordata Lam. — ***Aena***
BORAGINACEAE — IP 249 & GW

The timber is used for making the hull of a *perahu*. The timber is also used to make a torch for fishing at night. The wood is cut into short segments, tied together, and one end is lit to provide the light to go fishing. The wood is used for building and for carving statues.

Cyperus sp. — ***Hiha***
CYPERACEAE — IP 251 & GW

The fibrous stems are pounded and the stringy fibre used to tie corn cobs into bundles ready to carry.

Dendrobium affine Steudel — ***Dodilai***
ORCHIDACEAE — IP 252 & GW

The green sticky juice scraped from the pseudobulbs is rubbed into the tassels at the ends of *ikat* cloth to prevent them from fraying and to give them a smooth finish.

Fimbristylis sp. — ***Hiha***
CYPERACEAE — IP 256 & GW

The fibrous stems are pounded and the stringy fibre used to tie corn cobs into bundles ready to carry.

Guettarda speciosa L. — ***Bolarroe***
RUBIACEAE — IP 257 & GW

The wood is used for making the hull of a *perahu*, boat or canoe. The leaves are used to wrap small bundles of food. It is also used to hold lime powder while it is burnt.

Lysiphyllum binatum (Blanco) De Wit — ***Ruketpahu***
LEGUMINOSAE — IP 260 & GW

The leaves are boiled in water and the liquid used as an external wash to treat skin disorders, especially blistering. The boiled leaves may also be made into a compress and applied to the abdomen to treat a woman after childbirth. This compress can also be used to treat a headache by holding it on the forehead.

Pongamia pinnata (L.) Pierre — ***Ajuai***
LEGUMINOSAE — IP 262 & GW

The bark is pounded then water is added and the mixture used as pig feed. The leaves are wrapped around unripe fruit to make it ripen quickly. The sap from this plant is very hot and itchy if it touches the skin.

Dabobeo (Sumba), ***Daunkukukuda*** (Sabu)
Premna serratifolia L.
VERBENACEAE — IP 263 & GW

This plant is used as a treatment for the mothers of newborn babies. A few young leaves may be eaten raw daily by the mother for one week after childbirth to ensure a full recovery. Alternatively, the young leaves may be boiled in water and the liquid drunk. The liquid becomes red like tea, and sugar may be added for sweetening. The leaves may also be heated and applied daily for one week as a poultice to the abdomen, hips and upper thighs of the new mother. This also ensures a quick and full recovery from childbirth.

The small, dark fruit are eaten when they are ripe, mainly by children. The black fruit are very sweet. The leaves are boiled in water and the cooled liquid used as an external wash to treat asthma.

The name from Sabu, *Daunkuknkuda*, literally means 'the leaf shaped like the foot of a horse'.

Tinospora smilacina Benth. ***Loromanubou***
MENISPERMACEAE IP 270 & GW

The thick and flexible stems are used as rope to pull or tie up a canoe. The leaves, together with onion and garlic, are boiled and then crushed to a fine liquid. Some of this is drunk and some is rubbed onto the abdomen to cure stomachache.

Ximenia americana L. ***Bidaralaut***
OLACACEAE IP 271 & GW

The fruit can be eaten when they turn red and are fully ripe. They have a sweet and sour taste and are favoured by children. However, plants grown in cultivation have sweeter tasting flesh.

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